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FISH & GAME DEPARTMENT

Joseph C. Greenley, Director LAKE AND RESERVOIR INVESTIGATIONS Job

Performance Report

Project F-53-R-10



Job XI-a. Coeur d'Alene Lake Fisheries
Investigations

Period Covered: 1 March 1974 - 28 February 1975

by

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JOB PERFORMANCE REPORT

State of Idaho Name: LAKE AND RESERVOIR INVESTIGATIONS
Project No. F-53-R-10 Title: Coeur d'Alene Lake Fisheries In-
Job No. XI-a vestigations
Period Covered: 1 March 1974 to 28 February 1975

ABSTRACT:

We conducted an angler interview survey on Coeur d'Alene Lake during the summer of 1974. Kokanee were the preferred species sought by the interviewed anglers. The total kokanee catch rate in the entire lake for those anglers seeking kokanee was 1.16 fish per hour. The average lengths of kokanee taken in the catch were 268 mm (10.6 in) in June and July and 278 mm (10.9 in) in August. The harvest of cutthroat and rainbow trout was insignificant to the total catch in the lake with catch rates of .02 and .01 fish per hour, respectively.

Our efforts of trawling for Mysis shrimp (Mysis relicta) and analyzing kokanee stomachs yielded no shrimp. These indicators suggest that the mysids are not populating as rapidly in Coeur d'Alene Lake as they have been in other north Idaho lakes.

The contribution of early spawning kokanee to the total lake kokanee fishery remained questionable throughout the study because of difficulties in distinguishing differences between the early and late strains of kokanee in the catch. The early run of kokanee did not ascend Wolf Lodge Creek to spawn as was expected in view of previous introductions.

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RECOMMENDATIONS:

1. Continue to assess the success of Mysis shrimp introductions into Coeur d'Alene Lake by periodic lake trawls for shrimp and by analyzing game fish stomachs.
2. Continue to assess the success of introductions of early spawning kokanee into Coeur d'Alene Lake by examining sport caught kokanee for possible differences in flesh coloration and by attempting to locate spawning kokanee in Wolf Lodge Creek. Monitor water temperature regimes at the mouth of Wolf Lodge Creek using a thermograph during August and September to note any possible thermal barriers to ascending kokanee.

OBJECTIVES:

To monitor the following parameters from fish taken in the catch from Coeur d'Alene Lake:

1. Species composition
2. Catch rates
3. Length frequency distribution of kokanee
4. Size information on other species

To ascertain if Mysis are present in Coeur d'Alene Lake and if so, utilization of same by game fish.

To assess the effects of introductions of early spawning kokanee into Coeur d'Alene Lake.

INTRODUCTION:

The most recent creel census conducted on Coeur d'Alene Lake, prior to 1974, was done in 1967. The species composition of the catch in 1967 was about 98% kokanee and less than 1% cutthroat trout as compared to a catch of approximately 40% cutthroat in 1957 (Mallet 1968). Since 1967, *Mysis relicta* and early spawning kokanee have been introduced into Coeur d'Alene Lake in an effort to enhance the kokanee fishery (Table 1).

TECHNIQUES USED:

Angler Interviews

We conducted angler interviews on Coeur d'Alene Lake during the summer months (15 May to 1 September) of 1974 utilizing the same lake section boundaries as Mallet in 1967 (Fig. 1). Angler interviews were taken from a boat on 2 weekend days and 2 weekdays of each 2-week interval or as close to that time interval as possible throughout the summer. We collected information from each angler interview on species in the catch, hours fished, total lengths of the fish in the creel and differences in flesh coloration among the kokanee observed. We also sampled a few fish stomachs throughout the summer and asked some angler preference questions.

Table 1. Number of kokanee planted in Coeur d'Alene Lake and/or tributary streams since introduction.

Year	Total number of fish	Year	Total number of fish
1937	35,000	1956	314,488
1938	150,000	1957	832,896
1939	259,000	1958	608,000
1940	-	1959	920,000* (488,000)
1941	187,200	1960	1,128,000
1942	854,690	1961	1,304,000
1943	-	1962	750,000
1944	-	1963	226,090
1945	-	1964	113,856
1946	-	1965	615,317
1947	42,000	1966	725,305
1948	100,000	1967	1,166,422
1949	219,150	1968	1,004,857
1950	202,500	1969	448,368
1951	533,600	1970	1,089,820* (639,345)
1952	175,000	1971	1,322,144* (506,664)
1953	126,000	1972	666,528* (144,816)
1954	124,000	1973	* (209,000)
1955	365,400	1974	* (792,455)

* Parenthesis includes the number of the total fish that were from a strain of early spawning kokanee.

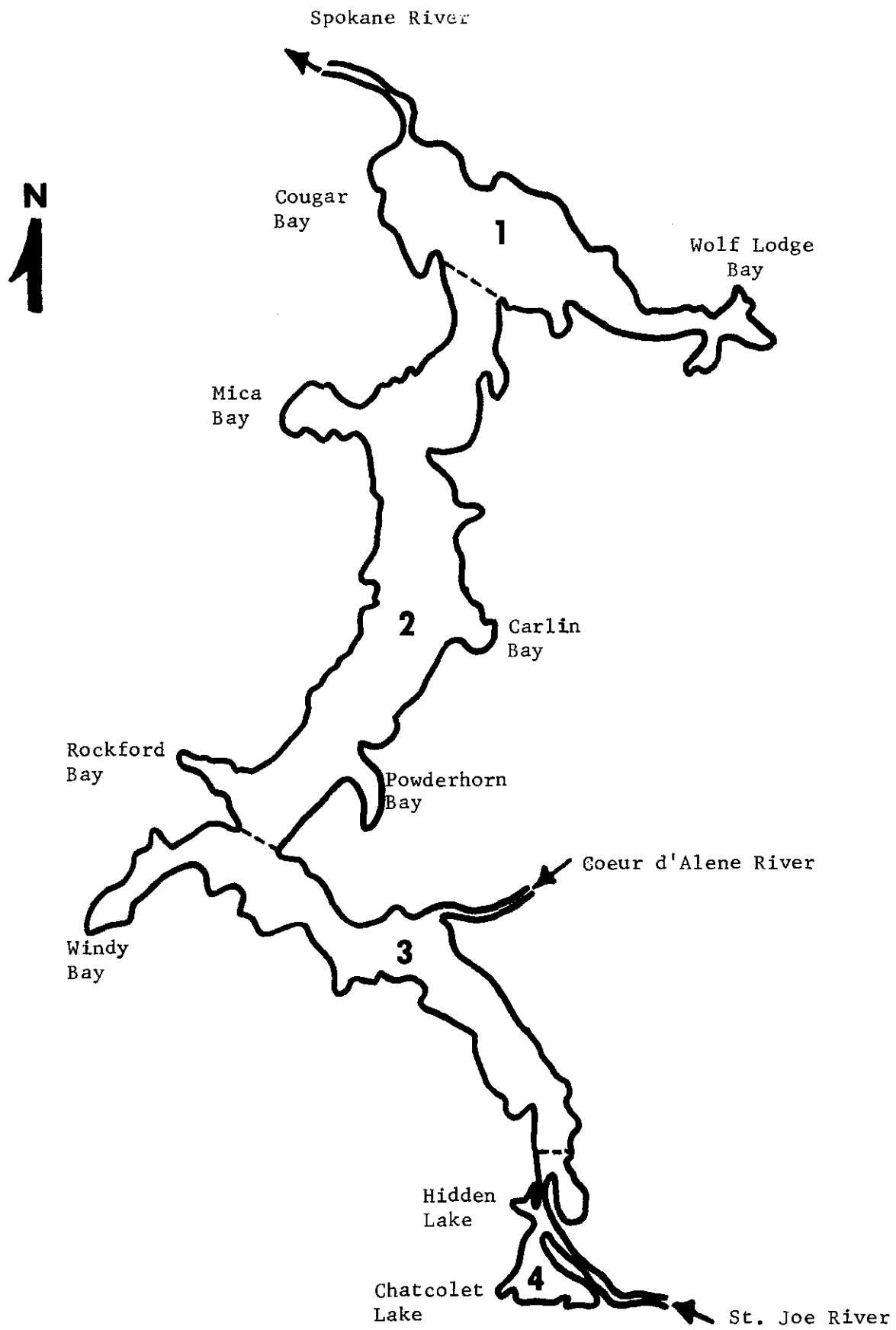


Figure 1. Map of Coeur d'Alene Lake showing lake sections used in the angler survey during the summer of 1974.

Mysis Shrimp Trawling

On 6 November 1974, we made 6 night trawls for Mysis shrimp close to Arrow Point in Coeur d'Alene Lake to check for the establishment of shrimp in the lake. The net used for trawling measures 0.83 m² (8.9 ft²) at its opening. Each trawl was made at a rate of 10 minutes per haul at a depth of 7.6 m (25 ft).

Spawning Observations in Wolf Lodge Creek

During August and September 1975 we made regular foot surveys of Wolf Lodge Creek to check for the presence of early spawning kokanee.

FINDINGS :

Species Composition of the Catch

The number and species of game fish reported in the catch of the anglers that were interviewed during the summer of 1974 in Coeur d'Alene Lake are as follows: kokanee 3,755 (79.71%), cutthroat 58 (1.23%), rainbow 29 (.62%), Dolly Varden 1 (.02%), perch 814 (17.28%), crappie 33 (.70%), bullhead 15 (.32%), largemouth bass 4 (.08%), and pumpkinseed 2 (.04%). Kokanee represented the predominant species in the angler catch with the spiny rays ranking second and the trouts and chars third in abundance. The highest catches of kokanee and trout occurred in lake sections 1 and 3 (Table 2).

Catch Rates

The total catch rate for those anglers seeking kokanee in Coeur d'Alene Lake during the summer of 1974 was 1.16 kokanee per hour (Table 3). The highest kokanee catch rate (1.30 fish per hour) occurred in lake section 2 with the least amount of effort and the least number of kokanee caught. Fishing success for kokanee in the lake remained good from early May into July and then declined in August (Table 3).

Most of the trout taken from Coeur d'Alene Lake were taken incidentally by anglers seeking kokanee. Catch rates for cutthroat and rainbow trout throughout the summer of 1974 in Coeur d'Alene Lake were .02 and .01 fish per hour, respectively (Table 4). A total of 58 cutthroat and 29 rainbow were reported during the summer from angler interviews. Most of the cutthroat and rainbow were found in lake sections 1 and 3 (Table 4). Only one Dolly Varden was reported during the summer and that was caught in lake section 3 during the 16 July to 31 July interval.

Five species of spiny-rayed fish (perch, crappie, bullhead, largemouth bass, and pumpkinseed) were reported from the angler interviews during the summer. The total catch rate for those anglers seeking spiny-rayed species only was 1.57 fish per hour with the catch rate for perch approaching 1.25 fish per hour.

Table 2. Numbers and species composition of the catch of interviewed anglers taken in Coeur d'Alene Lake during the summer of 1974.

Game fish species observed in catch	Lake section				Total
	1	2	3	4	
Kokanee	1,808	480	1,454	13	3,755
Cutthroat	25	5	28	--	58
Rainbow	1	2	15	11	29
Dolly Varden	--	--	1	--	1
Perch	80	51	33	650	814
Crappie	--	--	3	30	33
Bullhead	1	10	4	--	15
Largemouth bass	2	--	--	2	4
Pumpkinseed	--	--	--	2	2
Totals	1,917	548	1,538	708	4,711

Table 3. Catch rate (kokanee per hour) for those anglers seeking kokanee, by 2-week intervals in each lake section during the summer of 1974 in Coeur d'Alene Lake.

2-week interval	Catch rate (kokanee per hour) for each lake section				
	1	2	3	4	Total
16-31 May	--	--	1.60	--	1.60
1-15 June	1.00	1.25	2.14	.56	1.41
16-30 June	1.01	1.85	.30	.33	0.81
1-15 July	1.66	1.20	.88	.50	1.22
16-31 July	1.40	1.35	.95	--	1.27
1-15 August	.80	--	.25	--	0.71
16-31 August	.50	.95	1.00	--	0.70
Totals	1.10	1.30	1.20	.50	
Grand total (weighted)					1.16

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Length Frequency Distribution of Kokanee

We measured 1,028 kokanee taken in the angler catch during the summer of 1974 on Coeur d'Alene Lake. The length frequency distribution of those kokanee indicates no measurable growth between June and July but 10 mm (.4 in) of growth between July and August (Fig. 2). The average total lengths of kokanee taken in the catch were 268 mm (10.6 in) in June and July and 278 mm (10.9 in) in August. Spawning lengths of kokanee taken in Coeur d'Alene Lake from 1954 to 1974 are summarized in Table 5.

Lengths of Trout and Char

Of the 58 cutthroat trout reported from the angler interviews during the summer, we measured 34 fish that ranged from 195-390 mm (7.7-15.4 in) in total length and averaged 330 mm (13.0 in). We also measured three rain-bow trout that averaged 291 mm (11.5 in) in total length and one Dolly Varden that measured 305 mm (12.0 in).

Mysis Shrimp

We found no shrimp from the six Mysis shrimp trawls made 6 November 1974 close to Arrow Point in the lake. The trawls were made in the same location that Mysis had been introduced from Priest Lake in June.

Approximately 50 stomachs from adult kokanee from Coeur d'Alene Lake were examined during the summer of 1974. None contained Mysis shrimp.

Early Spawning Kokanee

Throughout the summer, during our interviews, we looked for differences in internal flesh coloration of kokanee to perhaps distinguish early spawning fish from late spawners. The flesh color in the early strain of kokanee is generally a much brighter red than the late spawning strain. Occasionally, we noticed a few fish that were a brighter red in flesh color but overall, through-out the summer, we felt there was no appreciable difference in color from the fish observed.

In August and September regular spot checks were made in Wolf Lodge Creek to check for early spawning kokanee. Wolf Lodge Creek remained low in water flow throughout the late summer and early fall and contained several stream diversions. We observed no early spawning kokanee in Wolf Lodge Creek during August, September, and early October of 1974.

Angler Preference Questions

Throughout the summer of 1974 we interviewed 1,723 anglers (85% boat, 15% bank) on Coeur d'Alene Lake. Of those anglers, 66% were residents and 34% were nonresidents. Twenty-one percent of the resident anglers resided in Coeur d'Alene and 21% of the nonresident anglers resided in Spokane, Washington.

Eighty-three percent of those 1,723 interviewed anglers were seeking kokanee, 2% were seeking trout and 15% were seeking spiny-rayed species.

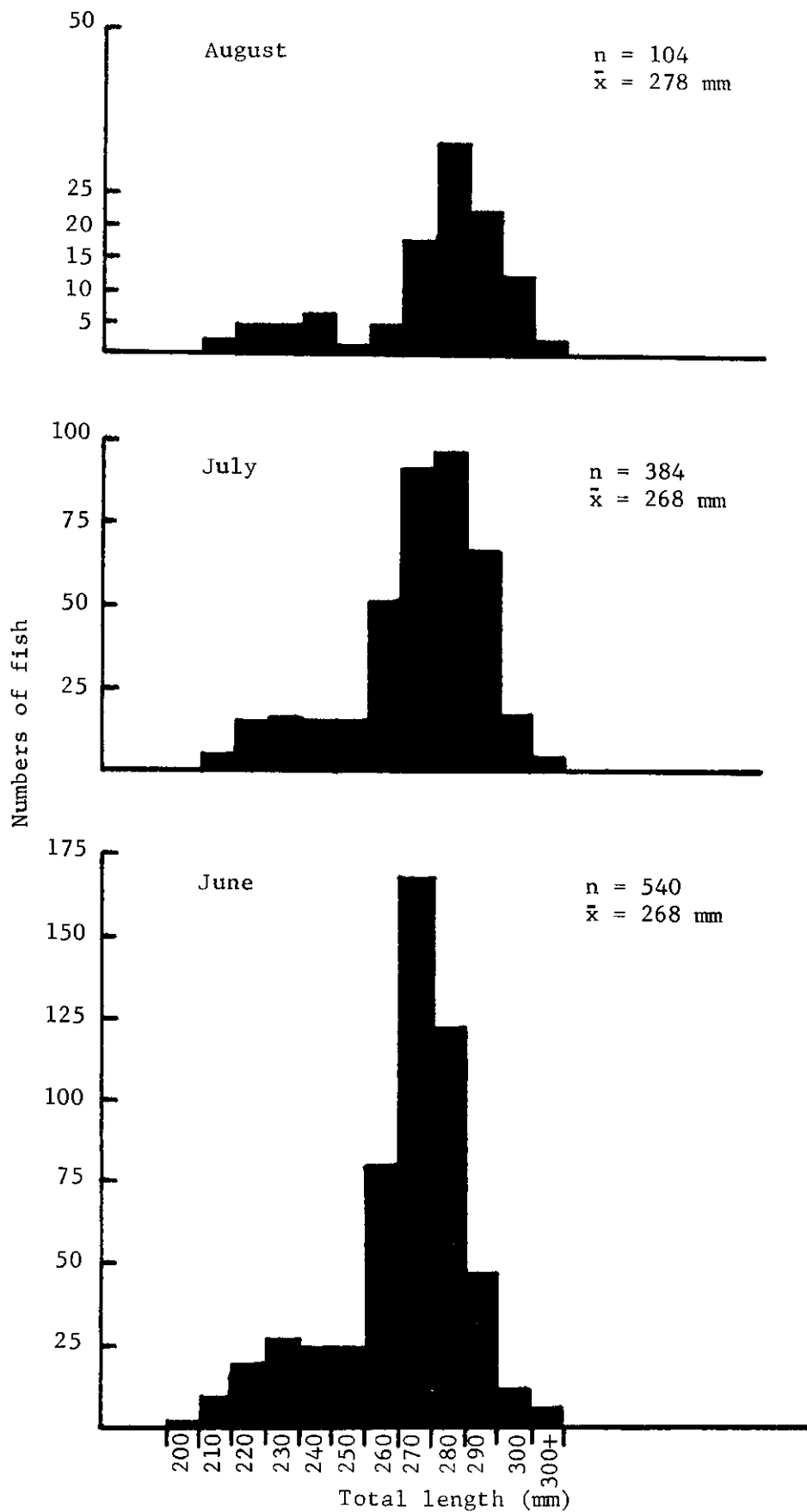


Figure 2. Length frequencies of kokanee measured from anglers creel in Coeur d'Alene Lake during the summer of 1974.

Table 5. Average measurements of spawning kokanee, by sex, from Coeur d'Alene Lake, 1954 to 1974.

Year	Males length mm (in)		Females length mm (in)		Year	Males length mm (in)		Females length mm (in)	
1954	409	(16.1)	381	(15.0)	1962	292	(11.5)	287	(11.3)
1955	371	(14.6)	361	(14.2)	1963	274	(10.8)	269	(10.6)
1956	--		--		1964	279	(11.0)	269	(10.6)
1957	399	(15.7)	343	(13.5)	1965	292	(11.5)	282	(11.1)
1958	363	(14.3)	361	(14.2)	1966	--		--	
1959	335	(13.2)	330	(13.0)	1967	318	(12.5)	302	(11.9)
1960	340	(13.4)	325	(12.8)	1973	329	(13.0)	309	(12.2)
1961	328	(12.9)	315	(12.4)	1974	312	(12.3)	296	(11.7)

Results of the angler preference questions are summarized in Table 6. Kokanee were the preferred species sought by the anglers who fished Coeur-d'Alene Lake during the summer of 1974. Almost all of the interviewed anglers would not favor the propagation of either northern or walleye pike in the Coeur d'Alene Lake system. Also, all of the anglers responding to the question about possession limits indicated they were pleased with the 25 possession limit placed on kokanee at the beginning of the 1974 fishing season.

DISCUSSION:

Kokanee

Coeur d'Alene Lake supported a high quality kokanee fishery during the summer of 1974 with a total catch rate of 1.16 kokanee per hour. The fish were of good size with many of them exceeding 280 mm (11 in) in length. The contribution of the early spawning variety to the total kokanee fishery in the lake is still somewhat unknown because of the difficulty in recognizing the two strains of fish in the catch. It was apparent that the early spawners did not enter Wolf Lodge Creek to spawn. Because of previous introductions of early spawning kokanee into Wolf Lodge Creek (Table 7) there should have been a spawning run of fish into the creek in 1974. During late August and early September Wolf Lodge Creek may have flow and water temperature regimes that inhibit the entrance of kokanee spawners to the creek.

Trout

The numbers of rainbow and cutthroat trout that we reported from the angler interviews were insignificant to the total catch of fish in the lake during the summer of 1974. The cutthroat and rainbow catch reflects the trend in Coeur d'Alene Lake over the last 20 years. Our interviews did not cover the spring or fall period when probably many of the cutthroat are harvested in the lake. The trout that we examined appeared to have a good condition factor.

Spiny Rays

Our angler interviews probably did not reach a majority of the anglers seeking spiny-rayed species because most of our contacts were made with boat anglers. However, 15% of all of the anglers interviewed during the summer were seeking the spiny-rayed species indicating to me that that fishery is an important segment of the total Coeur d'Alene Lake fishery.

Mysis Shrimp

Our effort to locate Mysis shrimp in Coeur d'Alene Lake during 1974 was limited. From six trawl hauls made close to Arrow Point in November, no shrimp were located. Arrow Point received approximately 50,000 shrimp that were introduced from Priest Lake in June of 1974. Because of the results of our previous shrimp trawling and stomach analysis of kokanee, I would conclude that Mysis are probably not populating very rapidly in Coeur d'Alene Lake, if at all. We have never recorded Mysis shrimp in Coeur d'Alene Lake by trawling.

Table 6. Results of the angler preference survey conducted on Coeur d'Alene Lake during the summer of 1974.

1. How is fishing?

Total respondents - 525

Good - 222 (42%)

Fair - 127 (24%)

Poor - 176 (34%)

2. Recent trend in the fishery

Total respondents - 427

Up - 184 (43%)

Down - 138 (32%)

No change - 105 (25%)

3. Preference for species caught

Total respondents - 646

Kokanee - 461 (71%)

Cutthroat - 77 (12%)

All trout - 36 (6%)

Spiny rays - 21 (3%)

No preference - 51 (8%)

4. Does fishing need improvement?

Total respondents - 458

Yes - 295 (64%)

No - 128 (28%)

No opinion - 35 (8%)

5. Are you pleased with the existing possession limit of 25 kokanee on Coeur d'Alene Lake?

Total respondents - 86

Yes - 86 (100%)

No - 0

6. Should the Department of Fish and Game increase cutthroat trout or kokanee in Coeur d'Alene Lake? Each seems to exist at the expense of the other.

Total respondents - 231

Cutthroat - 76 (33%)
Kokanee - 141 (61%)
No opinion - 14 (6%)

7. Walleye and northern pike would likely do well in the Coeur d'Alene Lake system but would also have a negative impact, possibly a serious one, on our present sport fisheries (kokanee, bass, and particularly trout--even stream fishing).

Would you like to see either walleye or northern pike introduced in Coeur d'Alene Lake?

Total respondents - 176

Yes - 5 (3%)
No - 171 (97%)

8. How may fishing be improved?

<u>Responses</u>	<u>Number</u>
Stock more kokanee	54
Introduce more Mysis shrimp	31
Improve cutthroat population	4
Eliminate handlining	3
Hold water level constant	3
Clean up the lake	3
Educate water skiers and speeders about fishermen	3
Introduce some type of trophy specie	2
Reduce angler pressure	1
Raise nonresident license fee	1
Clean up the beaches around the lake	1

Table 7. Numbers of early spawning kokanee fry that were introduced into the Coeur d'Alene Lake tributaries from 1970 to 1974.

Year	Tributaries							
	Wolf Lodge Creek	Big Creek	Santa Creek	Bond Creek	Mica Creek	Carlin Creek	Street Creek	Reeds Creek
1970	639,345	--	--	--	--	--	--	--
1971	506,664	--	--	--	--	--	--	--
1972	--	86,200	86,200	58,616	--	--	--	--
1973	--	69,982	69,982	69,982	--	--	--	--
1974	251,370	180,810	89,600	80,000	50,715	70,560	35,200	35,200

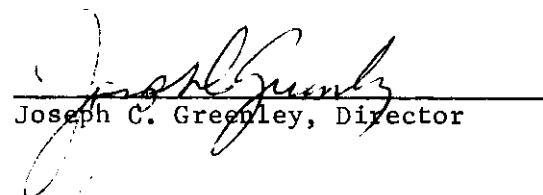
Mallet, Jerry L. 1968. Coeur d'Alene Lake Fisheries Investigations. Idaho Fish and Game Department, Completion Report. 19 p.

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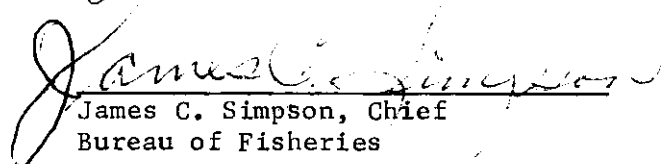
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